What is claimed is:

1. A control apparatus comprising:

deviation calculating means for calculating a deviation of an output of a controlled object from a predetermined target value;

first control input calculating means for calculating a control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm;

second control input calculating means for calculating a control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on a response specified control algorithm;

detecting means for detecting a state of said controlled object;

selecting means for selecting one of said first and second control input calculating means in accordance with the detected state of said controlled object as control input calculating means; and

switching means responsive to a change in said control input calculating means selected by said selecting means from one of said first and second control input calculating means to the other for switching from said one control input calculating means to said other control input calculating means when the calculated deviation falls within a predetermined range.

2. A control apparatus according to claim 1, wherein:

said second control input calculating means comprises a limiting means for setting said control input to a value within a predetermined allowable range in an initial stage of the switching from said first control input calculating means to said second control input calculating means.

3. A contort apparatus comprising:

air/fuel ratio sensing means for outputting a detection signal indicative of an air/fuel ratio of exhaust gases which flow through an exhaust passage of an internal combustion engine;

deviation calculating means for calculating a deviation of an output of said air/fuel ratio sensing means from a predetermined target value;

first air/fuel ratio calculating means for calculating a target air/fuel ratio of an air/fuel mixture supplied to said internal combustion engine for converging the output of said air/fuel ratio sensing means to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm;

second air/fuel ratio calculating means for calculating a target air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine for converging the output of said air/fuel ratio sensing means to said target value in accordance with the calculated deviation based on a response specified control

algorithm;

operating condition parameter detecting means for detecting an operating condition parameter indicative of an operating condition of said internal combustion engine;

selecting means for selecting one of said first and second air/fuel ratio calculating means in accordance with the detected operating condition parameter as air/fuel ratio calculating means;

switching means responsive to a change in said air/fuel ratio calculating means selected by said selecting means from one of said first and second air/fuel ratio calculating means to the other one for switching from said one air/fuel ratio calculating means to said other air/fuel ratio calculating means when the calculated deviation falls within a predetermined range; and

air/fuel ratio control means for controlling the air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine in accordance with the air/fuel ratio calculated by said switched air/fuel ratio calculating means.

4. A control apparatus according to claim 3, wherein:

said second air/fuel ratio calculating means comprises limiting means for setting said target air/fuel ratio to a value within a predetermined allowable range in an initial stage of the switching from said first air/fuel ratio calculating means to said second air/fuel ratio calculating means.

5. A control method comprising the steps of:

calculating a deviation of an output of a controlled object

from a predetermined target value;

calculating a first control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm;

calculating a second control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on a response specified control algorithm;

detecting a state of said controlled object;

selecting one of said first and second control inputs in accordance with the detected state of said controlled object as a control input; and

switching, in response to a change from one of said first and second control inputs to the other one, from said one control input to said other control input when the calculated deviation falls within a predetermined range.

6. A control method according to claim 5, wherein:

said step of calculating a second control input comprises the step of setting said control input to a value within a predetermined allowable range in an initial stage of the switching from said first control input to said second control input.

7. A method of controlling an air/fuel ratio of an air/fuel mixture supplied to an internal combustion engine, said method

comprising the steps of:

outputting a detection signal indicative of an air/fuel ratio of exhaust gases which flow through an exhaust passage of said internal combustion engine;

calculating a deviation of the detected air/fuel ratio from a predetermined target value;

calculating a first target air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine for converging the air/fuel ratio to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm;

calculating a second target air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine for converging the air/fuel ratio to said target value in accordance with the calculated deviation based on a response specified control algorithm;

detecting an operating condition parameter indicative of an operating condition of said internal combustion engine;

selecting one of said target first and second air/fuel ratios in accordance with the detected operating condition parameter as a target air/fuel ratio;

switching, in response to a change from one of said first and second target air/fuel ratios to the other one, from said one target air/fuel ratio to said other target air/fuel ratio when the calculated deviation falls within a predetermined range; and

controlling the air/fuel ratio of the air/fuel mixture

supplied to said internal combustion engine in accordance with the switched target air/fuel ratio.

8. A control method according to claim 7, wherein:

said step of calculating a second target air/fuel ratio comprises the step of setting said target air/fuel ratio to a value within a predetermined allowable range in an initial stage of the switching from said first target air/fuel ratio to said second target air/fuel ratio.

9. An engine control unit including a control program for causing a computer to calculate a deviation of an output of a controlled object from a predetermined target value; calculate a first control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm; calculate a second control input to said controlled object for converging the output of said controlled object to said target value in accordance with the calculated deviation based on a response specified control algorithm; detect a state of said controlled object; select one of said first and second control inputs in accordance with the detected state of said controlled object as a control input; and switch, in response to a change from one of said first and second control inputs to the other one, from said one control input to said other control input when the calculated deviation falls within a predetermined range.

10. An engine control unit according to claim 9, wherein said control program further causes the computer to set said control input to a value within a predetermined allowable range in an initial stage of the switching from said first control input to said second control input.

11. An engine control unit including a control program for causing a computer to output a detection signal indicative of an air/fuel ratio of exhaust gases which flow through an exhaust passage of an internal combustion engine; calculate a deviation of the detected air/fuel ratio from a predetermined target value; calculate a first target air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine for converging the air/fuel ratio to said target value in accordance with the calculated deviation based on one modulation algorithm selected from a Δ modulation algorithm, a $\Delta\Sigma$ modulation algorithm, and a $\Sigma\Delta$ modulation algorithm; calculate a second target air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine for converging the air/fuel ratio to said target value in accordance with the calculated deviation based on a response specified control algorithm; detect an operating condition parameter indicative of an operating condition of said internal combustion engine; select one of said target first and second air/fuel ratios in accordance with the detected operating condition parameter as a target air/fuel ratio; switch in response to a change from one of said first and second target air/fuel ratios to the other one, from said one target air/fuel ratio

to said other target air/fuel ratio when the calculated deviation falls within a predetermined range; and control the air/fuel ratio of the air/fuel mixture supplied to said internal combustion engine in accordance with the switched target air/fuel ratio.

12. An engine control unit according to claim 11, wherein said control program further causes the computer to set said target air/fuel ratio to a value within a predetermined allowable range in an initial stage of the switching from said first target air/fuel ratio to said second target air/fuel ratio.